

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 13345 Ko/tp	FOR FURTHER ACTION	See item 4 below
International application No. PCT/DE2004/002396	International filing date (<i>day/month/year</i>) 27 October 2004 (27.10.2004)	Priority date (<i>day/month/year</i>) 28 October 2003 (28.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant INFINEON TECHNOLOGIES AG		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).
 2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application
4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 27 July 2006 (27.07.2006)
Facsimile No. +41 22 338 82 70	Authorized officer <div style="text-align: center; font-weight: bold;">Agnes Wittmann-Regis</div> e-mail: pt06@wipo.int

PATENT COOPERATION TREATY

Translation

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See Form PCT/ISA/210**
(day/month/year) **(sheet 2)**

Applicant's or agent's file reference

13345 Ko/tp

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/DE2004/002396

International filing date (day/month/year)

27.10.2004

Priority date (day/month/year)

28.10.2003

International Patent Classification (IPC) or both national classification and IPC

G11C7/24, G11C16/34

Applicant

INFINEON TECHNOLOGIES AG

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2004/002396

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

This opinion has been established on the basis of a translation from the original language into the following language

_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☐

in written format

☐

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-12</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1-12</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1-12</u>	YES
	Claims _____	NO

2. Citations and explanations:

1. Reference is made to the following documents:

D1: US-B1-6 633 500 (CHOU MING-HUNG *ET AL*) 14
October 2003 (2003-10-14)

D2: US-A-5 671 180 (HIGUCHI *ET AL*) 23 September
1997 (1997-09-23)

D3: US-A-6 005 810 (WU *ET AL*) 21 December 1999
(1999-12-21)

D4: US-B1-6 646 941 (ATWELL WILLIAM DAUNE *ET AL*)
11 November 2003 (2003-11-11)

2. D1 is regarded as being the prior art closest to the subject matter of claim 1. It discloses (the references between parentheses relate to said document): a memory arrangement having rewritable memory cells (202, see D1, figure 7) which are arranged at crossovers between word lines (WL) and bit lines (D), in which the memory cells (MC) are configured in such a manner that the information stored in the memory cells (MC) is read out in an essentially non-destructive manner, the memory arrangement having a flag cell (702) for each word line (WL) (or each bit line (D)), an item of

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Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

information being able to be stored in said flag cell.

D1 does not disclose that the flag cell indicates whether at least one of the memory cells (202) along the respective word line (WL) (or along the respective bit line (D)) has been subjected to a read operation since the occurrence of a basic state.

The subject matter of claim 1 is thus novel (PCT Article 33(2)).

3. The problem addressed by the present invention can be considered that of monitoring read operations which gradually reduce the digital data value stored in a memory cell of the word line.

The solution to this problem proposed in claim 1 of the present application is based on marking word lines on which read operations have taken place.

Neither D1 nor D2 and D3 contains an indication of marking word lines on which read operations have taken place. Consequently, claim 1 involves an inventive step (PCT Article 33(3)).

4. Claims 2 to 7 are dependent on claim 1 and thus likewise meet the PCT requirements for novelty and inventive step.

5. Independent claim 8 does not meet the requirements

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Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
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of PCT Article 6 because said claim does not contain features which are essential to the invention. Specifically, it does not state that the memory arrangement has a flag cell (702) either for each word line (WL) or each bit line (D), an item of information which indicates whether at least one of the memory cells (202) along the respective word line (WL) (or along the respective bit line (D)) has been subjected to a read operation since the occurrence of a basic state being able to be stored in said flag cell.

In the present wording of claim 8, the latter does not seem to meet the requirements for novelty since the practice of carrying out a refresh in the case of a word line (bit line) which has previously been read seems to be the case in a flash memory which is refreshed after some operating time and was thus also probably read before the refresh.

6. Since claim 12 reflects the features of claim 1 which are essential to the invention, claim 12 likewise meets the requirements of PCT Article 33(2) and (3).